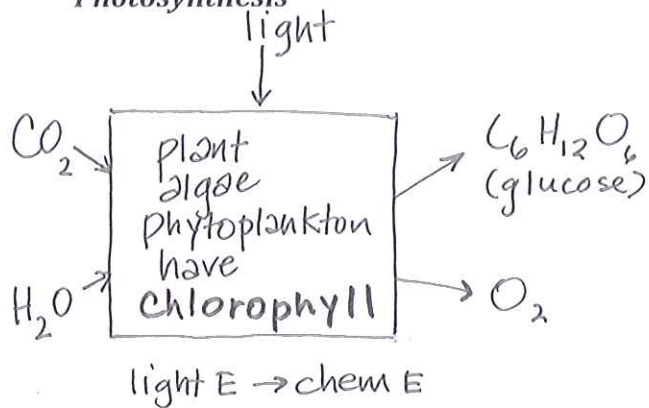


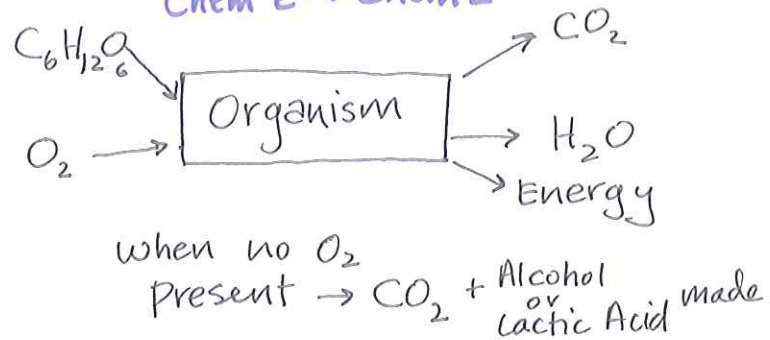
## Productivity 2

2.5.2 Describe photosynthesis and respiration in terms of inputs, outputs and energy transformations

### Photosynthesis



### Cellular Respiration



2.1.4 Explain the principles of pyramids of numbers, pyramids of biomass, and pyramids of productivity, and construct such pyramids from given data.

Show Biomass present @ a specific time  
STORAGE OF ENERGY

\* Show momentary stock  
\*  $\text{gm}^{-2}$  or  $\text{Jm}^{-2}$

Show Flow of E through trophic levels

\* Show rate at which stock is generated.

\*  $\text{gm}^{-2}\text{yr}^{-1}$   
 $\text{Jm}^{-2}\text{yr}^{-1}$

2.5.6 Define the terms and calculate the values of both gross primary productivity (GPP) and the net primary productivity (NPP) from given data.

$$\text{GPP} - R = \text{NPP}$$

$$500 \text{ Jm}^{-2}\text{yr}^{-1} - 200 \text{ Jm}^{-2}\text{yr}^{-1} = 300 \text{ Jm}^{-2}\text{yr}^{-1}$$

↑  
Total E made

↑  
E used for respiration

↑  
"Profit" E  
 $\rightarrow$  goes toward Biomass

2.5.7 Define the terms and calculate the values of both gross secondary productivity (GSP) and net secondary productivity (NSP) from given data.

$$\text{GSP} - R = \text{NSP}$$

$$200 \text{ Jm}^{-2}\text{yr}^{-1} - 175 \text{ Jm}^{-2}\text{yr}^{-1} = \text{NSP}$$

$$33 \text{ Jm}^{-2}\text{yr}^{-1} = \text{NSP}$$

Feces 108 J

↓ 33 J  
Growth (Biomass)

→ 67 J  
Cell Respiration

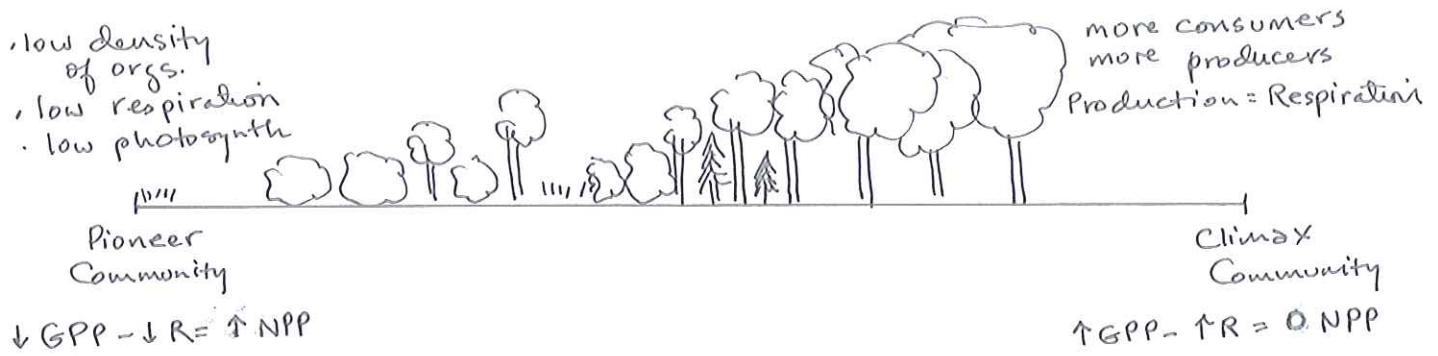
\* In this case R includes Respiration & Feces

10% rule to determine a Bird eating a caterpillar 20 J

10% rule  $\rightarrow$  200 J was what the plant had

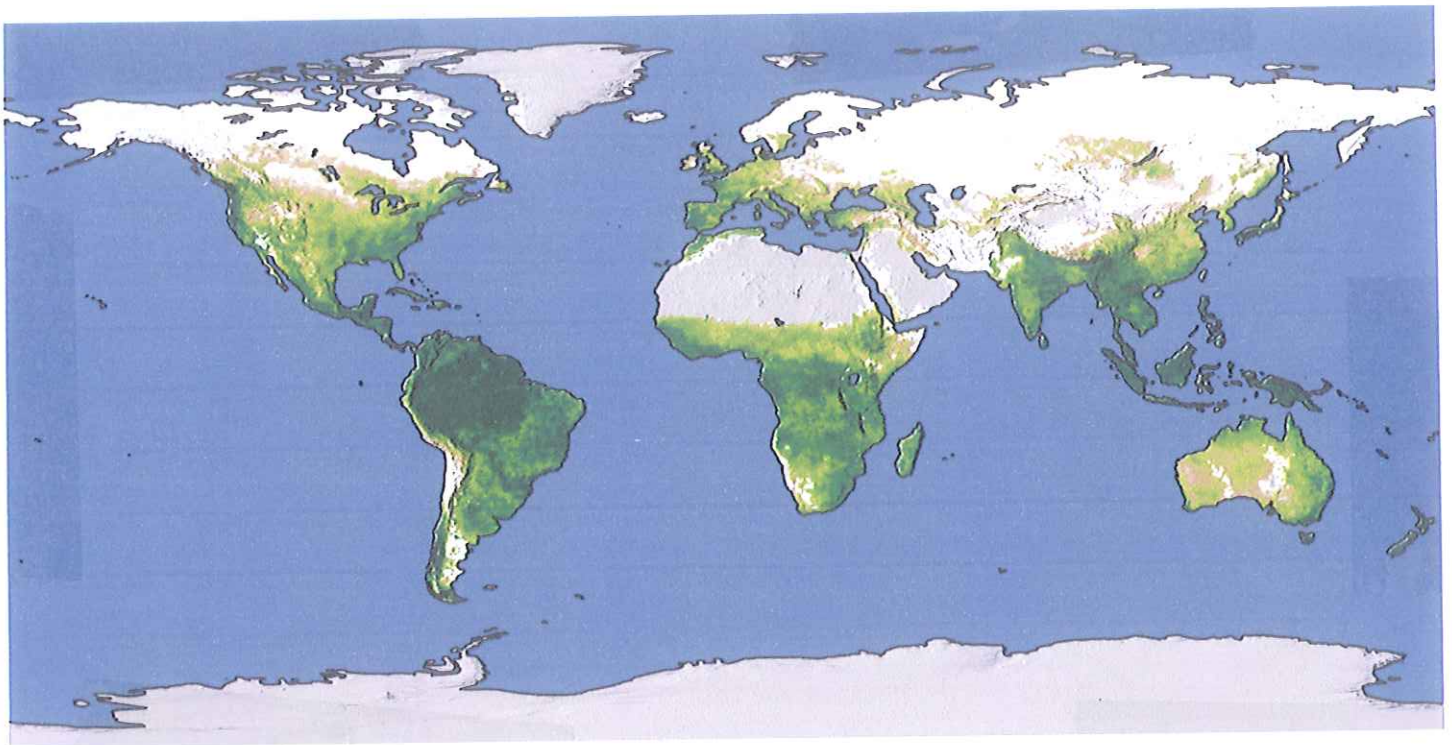
Plant material eaten by caterpillar 200 J

2.6.6 Explain the changes in **energy flow, gross & net productivity, diversity and mineral cycling** in different stages of succession.



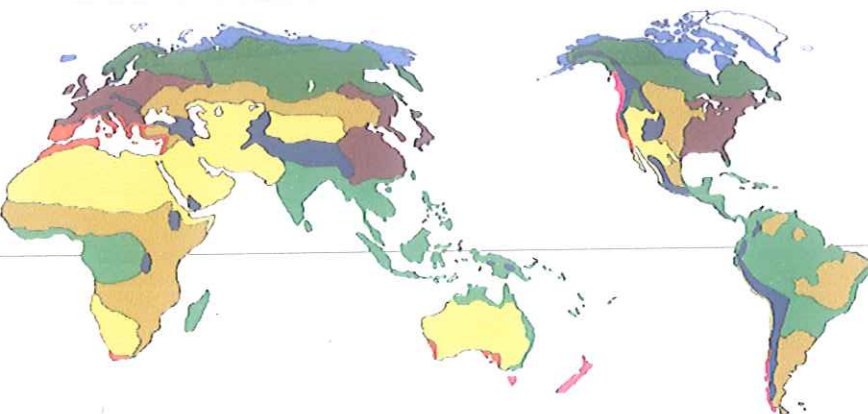
2.4.2 Explain the distribution, structure and **relative productivity** of tropical rainforests, deserts, tundra and any other biome

↓ NPP from  
NRSA



Most Productive Biomes:  
• Tropical Rainforest  
• Taiga

Least Productive Biomes:  
• Desert  
• Polar Ice



Tundra Chaparral Grassland Taiga Desert Mountain Zones  
Tropical Rainforest Temperate Evergreen Forest Temperate Deciduous Forest Polar Ice